Flood-dampened hay poses serious fire risk

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PROSSER, Wash. – Stored hay dampened by flooding in southwestern Washington poses a serious risk for spontaneous combustion, according to two Washington State University experts.

Moisture both reduces the hay’s quality and can create microbial growth and chemical reactions that could result in fire, according to WSU associate crop scientist Steve Fransen and Skagit County Extension educator Ned Zaugg.

{xtypo_quote_right}Watch for steam rising from bale surfaces, condensing on the roof and eves of the barn{/xtypo_quote_right}

The two have authored an informational paper on the risk, describing how to test for signs of spontaneous combustion and what to do about it. The Washington State Department of Agriculture is distributing the paper to farmers and ranchers in flood areas. The information is also available on the WSU Extension Web site: http://ext.wsu.edu.

Wet hay stimulates microbial growth that produces heat. The heat in turn dries out surrounding hay surfaces, stimulating more microbial growth. Various types of microbes live and die as the internal bale temperature climbs.

“Once the bale temperature reaches about 150 degrees Fahrenheit, the hay is on a one-way street and going in the wrong direction,” said Fransen. “Above that temperature more heat-resistant bacteria start chemical changes that rapidly increase temperatures to the point of spontaneous combustion. When the bale temperature gets to 150 to 160 degrees, it’s time to take immediate action.”

Zaugg said that farmers should be on the watch for early warning signs.

“Watch for steam rising from bale surfaces, condensing on the roof and eves of the barn. You may see molds starting to grow on those surfaces,” said Zaugg. “There will also be an acrid, hot tobacco odor from the bales.”

{xtypo_warning}If the haystack is heating up, don’t walk on top of it because internal burning bales may have consumed a quantity of hay creating the risk that the top, and you, could collapse into a burning inferno{/xtypo_warning}

The two recommend that if any of these warning signs appear it is wise to take the temperature of the bales in the stack.

If the hay is in round bales, probe the bale ends. If in square bales, probe from the sides. If you do not have a long temperature probe, you can use a crowbar.

If the haystack is large, push the crowbar in between bales as deep as possible. Leave the crowbar there for about two hours. Remove the bar and feel it with bare hands. If the crowbar is easily handled, without feeling heat or discomfort, the hay in that area has not heated yet. If the crowbar can only be held for a short time, the hay temperature is approaching 130 Fº. If the bar can only be touched briefly, hay temperatures are about 140 Fº. At 150 Fº, the bar is too hot to hold.

Another approach is to drive a pipe into the stack about 10 feet deep. Follow with a thermometer on a string to the final depth, leave the thermometer there for about 10 to 15 minutes, then pull it out and check the bale temperature. Repeat this same process in a number of places in the stack and repeat daily.

If the haystack is heating up, don’t walk on top of it because internal burning bales may have consumed a quantity of hay creating the risk that the top, and you, could collapse into a burning inferno.

If the bale temperature is at or approaching 150 Fº, immediately call the fire department and move all animals and equipment out and away from the barn. Then prepare a place to store good hay and a place for hot or burning hay.

Once the trained fire department personnel arrive, carefully start removing bales from the barn, keeping in mind that the new infusion of air could fuel the fire. Store bales individually to allow maximum airflow and heat loss. Large one-ton bales likely will need to be broken apart for more complete drying.

If flames appear in the stack or bale as the wet bales are removed douse them well with water and extinguish the fire.

The two also warn of another problem, the reduced nutritional value of wet hay. Heated hay may have a large amount of protein bound to the fiber and no longer available to livestock. It also may be contaminated and may not be suitable for use as feed.

More details are available in the paper authored by Fransen and Zaugg, which is available at http://ext.wsu.edu .

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